REMARKS

I. Summary of the Examiner's Action

A. Claim Rejections

As set forth in paragraph 5 on page 3 of the August 20 Office Action, claims 1, 2, 4, 6 – 8, 13 – 15, 17, 19 – 21 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent Application Publication No. 2003/0043928 A1 to Ling *et al.* (hereinafter "Ling" or "the Ling application") in view of United States Patent Application Publication No. 2004/0174809 A1 to Shor *et al.* (hereinafter "Shor" or "the Shor application").

As set forth in paragraph 6 on page 6 of the August 20 Office Action, claims 3, 5, 16 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ling in view of Shor and further in view of United States Patent No. 6,634,007 B1 to Koetter *et al.* (hereinafter "Koetter" or "the Koetter patent").

As set forth in paragraph 7 on page 8 of the August 20 Office Action, claims 9 – 12 and 22 – 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ling in view of Shor and further in view of United States Patent No. 4,574,252 to Slack *et al.* (hereinafter "Slack" or "the Slack patent").

As set forth in paragraph 8 on page 11 of the August 20 Office Action, claims 27 – 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ling in view of Shor and further in view of United States Patent No. 4,718,066 to Rogard (hereinafter "Rogard" or "the Rogard patent").

These rejections are respectfully disagreed with, and traversed below.

II. Applicants' Response – Claim Rejections

A. Rejection of Claims 1, 2, 4, 6 – 8, 13 – 15, 17, 19 – 21 and 26 under 35 U.S.C. § 102(b)

Applicants reproduce amended claim 1 here (emphasis added):

> 1. A method to operate a digital signal receiver, comprising:
>
> detecting the occurrence of a symbol degrading event for a received signal, wherein the symbol degrading event occurs after transmission and before reception of the received signal;
>
> inserting zero symbols into a received symbol stream to replace symbols degraded by the signal degrading event prior to de-interleaving the received signal; and
>
> error correction decoding the received symbol stream having the inserted zero symbols.

Applicants respectfully submit that it is not seen where any of the art of record, whether taken singly or in combination, either describes or suggests the subject matter of claim 1.

Applicants can only conclude the Examiner is construing "puncturing" as a "symbol degrading event". With all due respect, Applicants submit that a transformational process like puncturing wherein a code at one rate is transformed into another code at a different rate would not be construed as a "symbol-degrading event" within the context of Applicants' invention. A symbol degrading event in Applicants' context is something that occurs after the signal has been transmitted but before it is is received, like the rotating helicopter blade example provided by Applicants. Nonetheless, Applicants have amended the claims to make clear that the symbols are degraded by an event that occurs after transmission but prior to reception. The complementary operations performed in Ling wherein zeros are inserted into a punctured code are not done to remedy a symbol degrading event but rather merely as a complementary operation to another operation that occurs at the transmitter. As stated previously, Ling's method adopts particular encoding techniques to combat expected signal fading that include, at least in part, the insertion of zeros *at the transmitter* associated with the puncturing process. The insertion of zeros at the receiver is merely a complementary operation and is not done to replace degraded symbols as in Applicants' invention.

Applicants reproduce the following description of an aspect of the invention from the application appearing at page 2, lines 17 – 24 (emphasis added):

> In the preferred embodiment zero symbols are inserted into the received signal stream, prior to the FEC decoder, at times that are

> estimated or otherwise determined to correspond to periods of jamming or severe fading. The zero symbols effectively 'erase' the severely degraded symbols. It is assumed that the presence of the zero symbols is less detrimental to the operation of the FEC decoder than the presence of the severely degraded symbols, especially in that the channel interleaving/de-interleaving operations result in the zero symbols being temporarily distributed over a large block of received symbols."

The fact that zeros are inserted in Ling at the receiver to perform a complementary operation to an operation performed at the transmitter, and not to replace symbols degraded by a symbol degrading event that occurred after transmission but prior to reception is apparent from this portion of Ling appearing at paragraph [0030], lines 13 – 21:

> "Erasures (e.g., zero value indicative) are then inserted by a depuncturer 159 for coded bits punctured at system 110. The de-punctured values are then de-interleaved by a channel de-interleaver 160 and further decoded by decoder 162 to a data sink 164. The channel deinterleaving, de-puncturing and de-coding are complementary to the channel interleaving, puncturing, and encoding performed at the transmitter."

These operations neither concern "detecting the occurrence of a symbol-degrading event for a received signal", nor "inserting zero symbols into a received symbol stream to replace symbols degraded by the symbol degrading event ..." as is required by claim 1. Rather, the operations relied upon by the Examiner are merely complementary operations performed at the receiver necessary to decode a received signal that has been encoded in

a particular manner. Accordingly, the relied-upon operations of Ling, in particular, the insertion of zeros, have nothing to do with counteracting the effect of a symbol degrading event that occurs after transmission and before reception as in the case of Applicant's claimed subject matter.

If the Examiner disagrees, Applicants request that the Examiner identify with particularity where in the method of Ling "inserting zero symbols into a received symbol stream to replace symbols degraded by the signal degrading event prior to de-interleaving the received signal" is either described or suggested. Applicants respectfully submit that since the insertion of zeros in Ling is done as part of a receiver operation that is complementary to a transmitter operation that occurred during the encoding process, and *not* in response to a symbol degrading event, such subject matter will not be found.

Shor is not seen to remedy the deficiencies of the Ling application. Shor merely speaks of zero padding, another transformational process used in coding to make one code from another. Shor does not describe or suggest inserting zeros to replace symbols degraded by a symbol degrading event that occurs between the transmitter and the receiver.

As a result, Applicants submit that claim 1 is patentable over any of the art of record, whether taken singly or in combination. Applicants therefore respectfully request that the rejection of claim 1 be withdrawn. Applicants likewise request that the rejection

of independent claim 14 be withdrawn both for reasons similar to those set forth above with respect to claim 1 and for reasons having to do with claim 14's independently recited features. Claims 2, 4, 6 – 8, 13, 15, 17, 19 – 21 and 26 are patentable as depending from allowable base claims.

B. Rejection of Claims 3, 5, 16 and 18 under 35 U.S.C. § 103(a)

Koetter does not remedy the above-identified deficiencies of Ling. Accordingly, Applicants submit that claims 3, 5, 16 and 18 are patentable over the art of record both for the foregoing reasons set forth with respect to claim 1 and for reasons having to do with their separately-recited features. Applicants therefore respectfully request that the rejection of claims 3, 5, 16 and 18 be withdrawn.

C. Rejection of Claims 9 – 12 and 22 – 25 under 35 U.S.C. § 103(a)

Slack does not remedy the above-identified deficiencies of Ling. Accordingly, Applicants submit that claims 9 – 12 and 22 – 25 are patentable over the art of record both for the foregoing reasons set forth above with respect to claim 1 and for reasons having to do with their separately-recited features. Applicants therefore respectfully request that the rejection of claims 9 – 12 and 22 – 25 be withdrawn.

D. Rejection of Claims 21 – 31 under 35 U.S.C. § 103(a)

Applicants reproduce claim 27 here (emphasis added):

27. A method to receive a signal that passes through a channel that is periodically obstructed by a rotating propeller blade, comprising:

detecting the occurrence of a fading condition due to obstruction by the propeller blade;

in response to detecting the occurrence of the fading condition, inserting zero symbols into a received symbol stream at the receiver to replace symbols degraded by the fading condition caused by the obstructing propeller blade;

de-interleaving the received symbol stream having the inserted zero symbols; and

decoding the received symbol stream having the inserted zero symbols.

Applicants respectfully submit that the foregoing arguments presented with respect to claim 1 are equally applicable to claim 27. Further, Rogard neither remedies the above-identified deficiencies of the Ling patent nor discloses the subject matter relied upon by the Examiner.

In particular, as set forth above, the Ling patent inserts zeros as part of complementary decoding operations. Nowhere does Ling either describe or suggest inserting zeros in response to detecting the occurrence of a fading condition where in the fading conditions occurs after transmission and before reception of the signal. Accordingly, Ling is not seen to disclose the subject matter for which it is relied upon by the Examiner.

In addition, Rogards is not seen to disclose "detecting the occurrence of a fading condition by the propeller blade". The only portion of Rogard relied upon by the Examiner to describe or suggest this subject matter, which appears at column 1, lines 22 – 34, is reproduced here:

> "In the case of a satellite to-earth station link, for which the invention is particularly suitable, the transmission of data is frequently affected by periods of fading or even complete interruption of communication (black-out). FIGS. 3 and 4 of the accompanying drawings, which represent the received signal displayed on the cathode screen of a spectrum analyzer, show typical examples of such disturbances: the signal of FIG. 3 corresponds to periodic fading such as may be produced by regularly spaced trees along which a receiver sis driving; FIG. 4 corresponds to temporary fading caused by passing under a bridge which crosses a motorway."

Applicant respectfully submits that neither this portion, nor any other portion, of Rogard either describes or suggests the above-emphasized portion of claim 27. In particular, Rogard neither describes nor suggests inserting zeros in the manner of Applicants' invention when a fading condition caused by propeller blades is detected.

As a result, Applicants submit that claim 27 is patentable over any of the art of record, whether taken singly or in combination. Applicants therefore respectfully request that the rejection of claim 27 be withdrawn. Applicants likewise request that the rejection of claims 28 – 29 be withdrawn as well since these claims depend from an

allowable base claim. Independent claims 30 and 31 are patentable for reasons similar to those set forth above with respect to claim 27.

IV. Conclusion

Applicants submit that in light of the foregoing amendments and remarks the application is now in condition for allowance. Applicants therefore respectfully request that the outstanding rejections be withdrawn and that the case be passed to issuance.

Respectfully submitted,

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